CLAIMS

1. A method for performing time-domain equalization of an information signal represented by an optical signal, said method comprising:

receiving the optical signal;

optically splitting the optical signal into beams;

optically delaying at least one of the beams;

detecting a plurality of the beams to generate respective electrical signal components; and

combining a plurality of the electrical signal components to generate an electrical output signal representing the information signal.

2. The method of claim 1, further comprising:

optically scaling at least one of the beams.

3. The method of claim 2, wherein, in detecting the plurality of the beams, at least one of the beams detected has not been subjected to at least one of (a) the delaying, and (b) the scaling.

4. The method of claim 1, further comprising:

electrically scaling at least one of the electrical signal components.

5. The method of claim 1, wherein optically splitting the optical signal includes:

providing a beamsplitter; and

performing the splitting using the beamsplitter.

6. The method of claim 1, wherein optically splitting the optical signal includes:

providing a diffractive optical element; and

performing the splitting using the diffractive optical element.

7. The method of claim 2, further comprising:

providing a diffractive optical element; and

performing the splitting and the scaling using the diffractive optical element.

8. The method of claim 1, wherein:

in optically delaying at least one of the beams, the at least one of the beams is delayed relative to at least one other of the beams; and

optically delaying at least one of the beams includes:

providing a first optical path and a second optical path;

directing the at least one of the beams via the first optical path; and

directing the at least one other of the beams via the second optical path.

9. The method of claim 8, wherein the first optical path is physically longer than the second optical path.

10. The method of claim 8, wherein:

each of the first optical path and the second optical path is defined, at least in part, by an optical transmission medium having an effective refractive index; and

the effective refractive index of the optical transmission medium of the first optical path is greater than the effective refractive index of the optical transmission medium of the second optical path.

11. The method of claim 1, wherein, in optically delaying at least one of the beams, each of the beams is delayed relative to every other of the beams.

12. The method of claim 1, wherein, in combining the plurality of electrical signal components, at least one of the electrical signal components is summed negatively.

13. The method of claim 2, wherein, in scaling at least one of the beams, the at least one of the beams is optically attenuated relative to at least one other of the beams.

14. The method of claim 1, further comprising:

optically dividing each of the beams into a first sub-beam and a second sub-beam having an intensity ratio; and

wherein detecting a plurality of the beams includes detecting the first sub-beams to generate respective first electrical signal sub-components and detecting the second sub-beams to generate respective second electrical signal sub-components; and

wherein combining the plurality of electrical signal components includes summing the first and second electrical signal sub-components to generate the electrical output signal.

15. The method of claim 14, wherein combining the plurality of electrical signal components includes:

summing the first electrical signal sub-components to generate a first electrical signal;

summing the second electrical signal sub-components to generate a second electrical signal; and

subtracting the first electrical signal from the second electrical signal to generate the electrical output signal.

16. The method of claim 14, wherein combining the plurality of electrical signal components includes:

subtracting each of the first electrical signal sub-components from a corresponding one of the second electrical signal sub-components to generate a respective one of the electrical signal components; and

summing the electrical signal components to generate the electrical output signal.

17. The method of claim 14, further comprising:

providing a splitter; and

performing the splitting and the dividing using the splitter.

18. The method of claim 14, wherein optically scaling at least one of the beams includes attenuating at least one of the first sub-beam and the second sub-beam of the at least one of the beams to set the intensity ratio.

19. The method of claim 14, wherein optically dividing each of the plurality of beams includes:

providing a polarization-dispersive device;

passing each of the plurality of beams through the polarization-dispersive device to separate the beams into the respective first sub-beam and second sub-beam; and

rotating a polarization direction of at least one of the plurality of the beams to set the intensity ratio of the respective first sub-beam and second sub-beam.

20. A system for performing time-domain equalization of an information signal represented by an optical signal, said system comprising:

means for receiving the optical signal;

means for optically splitting the optical signal into beams;

means for optically delaying at least one of the beams;

means for detecting a plurality of the beams to generate respective electrical signal components; and

means for combining plurality of the electrical signal components to generate an electrical output signal representing the information signal.

21. The system of claim 20, further comprising:

means for optically dividing each of the beams into a first sub-beam and a second sub-beam having an intensity ratio; and

wherein said means for detecting a plurality of the beams includes means for detecting the first sub-beams to generate respective first electrical signal sub-components and means for detecting the second sub-beams to generate respective second electrical signal sub-components; and

wherein said means for combining the plurality of electrical signal components includes means for summing the first and second electrical signal sub-components to generate the electrical output signal.

22. The system of claim 21, wherein said means for combining the plurality of electrical signal components includes:

means for summing the first electrical signal sub-components to generate a first electrical signal;

means for summing the second electrical signal sub-components to generate a second electrical signal; and

means for subtracting the first electrical signal from the second electrical signal to generate the electrical output signal.

23. The system of claim 20, further comprising:

means for optically scaling at least one of the beams.

24. The system of claim 20, further comprising:

means for electrically scaling at least one of the beams.

25. A system for performing time-domain equalization of an information signal represented by an optical signal, said system comprising:

a beamsplitter adapted to split the optical signal optically into beams;

a delay component optically communicating with the beamsplitter, the delay component being configured to receive at least one of the beams and delay the at least one of the beams optically;

an array of photodetectors arranged to receive the at least one of the beams, the array of photodetectors being adapted to generate respective electrical signal components corresponding to the at least one of the beams; and

an amplifier arranged to receive the electrical signal components, the amplifier being adapted to generate an electrical output signal representing the information signal.

26. The system of claim 25, further comprising:

an attentuator optically communicating with the delay component and the array of photodetectors, the attenuator being configured to scale at least one of the beams and provide the at least one of the beams to the array of photodetectors after scaling.

27. The system of claim 25, further comprising:

an attentuator electrically communicating with the array of photodetectors and the amplifier, the attenuator being configured to scale at least one of the electrical signal components and provide the at least one of the electrical signal components to the amplifier after scaling.